

**Statement of  
Dr. Edward Barrett  
Director of Research, Stockdale Center  
United States Naval Academy  
“Rise of the Drones: Unmanned Systems and the Future of War”  
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Subcommittee on National Security and Foreign Affairs  
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Mr. Chairman and Subcommittee members, thank you for inviting me to speak about the ethical and educational ramifications of unmanned weapons systems. While ethical and educational inquiries often lag behind technological developments, the efforts of Mr. Singer and others have generated a timely and fruitful conversation among ethicists, educators, engineers, industry and military leaders, and civilian policymakers. Today’s proceedings will surely contribute to that important conversation. Speaking as a civilian academic, then, I will first offer some reflections on these systems’ ethical advantages and challenges, and then briefly discuss related educational initiatives at the Naval Academy.

The goals animating the development and use of unmanned platforms are ethically commendable. While sometimes excoriated as merely “prudential,” effectiveness and efficiency are, fundamentally, moral imperatives. Constituted and supported by its citizen taxpayers, the liberal democratic state is morally obligated to effectively defend their human rights with their limited resources. Additionally, I would argue that unmanned systems are consistent with a society’s duty to avoid unnecessary risks to its combatants—a duty that sparked the recent controversy over “Up-Armored” vehicles.

But these rights and corresponding duties must be weighed against other ethical considerations. The venerable just war criteria that now undergird international law specify both pre-war and in-war requirements. To be permissible, war must be the last resort available to a state intending to pursue a just cause, and circumstances must indicate a reasonable chance of succeeding in a proportionate manner. Once in war, harms must be necessary and proportionate. *Vis-à-vis* uninvolved civilians who maintain their rights *not* to be harmed, soldiers incur additional risk to avoid, and assign greater weight to, foreseeable harm to innocents.

In this ethical context, I want to highlight a few challenges generated by unmanned systems. First, they could encourage unjust wars. Cost reductions, of course, allow states to more readily pursue just causes. But favorable alterations to pre-war proportionality calculations could also reduce the rigor with which non-violent alternatives are pursued, and thus encourage

unnecessary—and therefore unjust—wars. Additionally, and echoing concerns about private security firms and cyberattack capabilities, these less visible weapons could facilitate the circumvention of legitimate authority and pursuit of unjust causes. While these moral hazards obviously do not require us to maximize war costs and minimize unmanned systems, they do require efforts to better inform and monitor national security decisionmakers.

Second, once in war, remote-controlled systems—compared to manned—are said to induce unnecessary and disproportionate harm, especially to civilians. The argument assumes that soldiers engaged in such “virtual warfare” are less situationally aware, and also less restrained because of emotional detachment. However, accumulating data points in the opposite direction. Sensor improvements, lack of fear-induced haste, reduced anger levels, and crystal clarity about strike damage all combine to actually enhance awareness and restraint. If true, this data suggests that it would be unethical *not* to use remote-controlled systems—unless mitigating factors pertained.

This qualification brings us to a third ethical consideration. Reasonable chance of success in counterinsurgency and stability operations—where indigenous perceptions are crucial—requires the judicious use of unmanned systems. Mistaken perceptions that these weapons are less discriminate, or are indicative of flawed characters and/or tepid commitments, can undermine efforts unless accompanied by adjustments to footprints and perceptions. Also, ground robots are incapable of developing necessary personal relationships with local citizens. Again, these arguments suggest the need for prudent, not unreflective, limitations.

But the use of *autonomous* strike systems, my fourth and final ethical consideration, requires more caution. Again, effectiveness and efficiency would be important benefits. Truly robotic air, sea, and ground capabilities would sense, decide, and act more quickly than human beings. In an anti-access environment, a long range system capable of independently navigating to, identifying, and striking mobile targets would bolster conventional extended deterrence. And the need to merely monitor, not control, these systems would reduce personnel costs.

But exactly what would these autonomous systems sense, decide, and do? Would they adequately distinguish combatants from non-legitimate targets such as bystanding civilians and surrendering soldiers—a task complicated by counter-countermeasure requirements? Would they adequately—i.e., at least as well as humans—comply with necessity and proportionality imperatives? Minimizing these possible *in bello* errors would require the elusive ability to credibly attribute bad results to a culprit—designers, producers, acquisition personnel, commanders, users, and perhaps even robots themselves. And if the notion of “robot responsibility” ever becomes meaningful, would a self-conscious and willful machine choose its own ends, and even be considered a person with rights?

While robotic personhood is a titillating idea, nearer-term possibilities suggest a focus on the first few concerns. Computer scientist Ron Arkin is working assiduously to develop adequately discriminating and ethical robots with responsibility attribution capabilities, and I would not bet against him. But prior to that day, I would advise an incremental approach similar to that used with remote-controlled systems: intelligence missions first, strike missions later. Given the complexity involved, I would also restrict initial strike missions to non-lethal weapons and combatant-only areas. One possible exception to this non-lethal recommendation would involve autonomous systems targeting submarines, where one only would have to identify friendly combatants, enemy combatants, and perhaps whales.

In closing, I want to assure the Subcommittee that military educators are preparing military operators and staffers to think ethically about these and other emerging technologies. At the Naval Academy, the core ethics course taken by every second-year midshipman covers these issues and their theoretical foundations. Last year, Mr. Singer delivered an endowed lecture to the entire second year class. The Department of Leadership, Ethics, and Law offers an ethics elective dedicated to emerging military technologies, including robotics. History and engineering and courses that address these issues include History of Technology, Advanced Topics in Robotics, Advanced Technologies, Emerging Technologies, Principles of Systems Engineering, and Introduction to Systems Engineering. In April, 300 students in this last class will witness a debate between Ron Arkin and his less sanguine critic, Peter Asaro. And also in April, the Stockdale Center for Ethical Leadership, the Academy's ethics and military policy think tank, will host a two-day conference on the ethical ramifications of emerging military technologies attended by instructors from all U.S. service academies, staff colleges, and war colleges—and perhaps by a few congressional staffers.

Mr. Chairman and Subcommittee members, thank you for the opportunity to address these issues, and I look forward to your questions.